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Evaluation Report

OFFICE OF THE INSPECTOR GENERAL

ECONOMIC IMPACT OF THE USE OF TOBACCO IN DOD

Report No. 97-060 December 31, 1996

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Acronyms

AAFES	Army and Air Force Exchange Service
CONUS	Continental United States
DeCA	Defense Commissary Agency

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

December 31, 1996

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE (FORCE MANAGEMENT POLICY)

SUBJECT: Evaluation Report on the Economic Impact of the Use of Tobacco in DoD (Report No. 97-060)

We are providing this evaluation report for review and comment. We considered management comments on a draft of this report in preparing the final report.

DoD Directive 7650.3 requires that all recommendations be resolved promptly. Therefore, we request that the Assistant Secretary of Defense (Force Management Policy) provide additional comments on unresolved Recommendation 1. and revised Recommendations 2. and 3. We request the comments by March 3, 1997.

We appreciate the courtesies extended to the evaluation staff. Questions on the evaluation should be directed to Mr. Michael A. Joseph, Audit Program Director, or Mr. Timothy J. Tonkovic, Audit Project Manager, at (757) 766-2703. See Appendix H for the report distribution. The evaluation team members are listed inside the back cover.

David K. Steensma

David K. Steensma
Deputy Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. 97-060 **December 31, 1996**
(Project No. 6LF-0050)

Economic Impact of the Use of Tobacco in DoD

Executive Summary

Introduction. According to the United States Department of Health and Human Services, disease attributed to tobacco use remains the leading cause of preventable illness and premature death in the United States, causing more than 400,000 deaths and 5 million years of potential life lost each year. On average, each smoker who dies from a smoking-related disease forfeits about 12 years of life. DoD has made progress in reducing cigarette smoking among active duty personnel; however, tobacco usage rates are still above goals of DoD and the civilian sector.

Evaluation Objectives. The primary objective was to evaluate the economic impact of the use of tobacco and alcohol in DoD. We plan to report on the objective relating to alcohol use in a subsequent report. We did not review the management control program because the majority of information used in the evaluation was developed and prepared by sources outside DoD. Additionally, the objectives concerned policy issues rather than control techniques.

Evaluation Results. DoD retail system pricing policies for tobacco products encourage high sales and are inconsistent with DoD goals for a healthy active duty force. Commissary tobacco prices were up to 76 percent less than commercial retail prices. On November 1, 1996, prices were raised on tobacco products in commissaries to the higher prevailing DoD exchanges outlet prices. Depending on Region and pricing level, tobacco prices in military outlet exchanges ranged from 0 percent to 51 percent less than commercial retail prices. In FY 1995, DoD retail system tobacco product sales of $747 million generated gross profits and surcharge revenues of about $103 million. In contrast, DoD health care and lost productivity costs attributable to tobacco use were 9 times higher, or about $930 million for the same period. Further, about 31.9 percent of active duty military are smokers.

Summary of Recommendations. The evaluation recommendations are intended to assist DoD in achieving an active duty smoking rate of 20 percent by the year 2000. We recommend that the Assistant Secretary of Defense (Force Management Policy) establish a policy that requires DoD tobacco product prices to be equivalent to local commercial retail outlet prices. We also recommend that the Assistant Secretary notify Congress of his intent to change tobacco product prices and ensure that the DoD retail system adopt promotional practices that reflect the commercial marketplace.

Management Comments. The Executive Director, Morale, Welfare, Recreation and Resale Activities in the Office of the Assistant Secretary of Defense (Force Management Policy), partially concurred with the recommendation to establish a policy for raising DoD tobacco product prices equivalent to local commercial outlets. He stated that commissaries no longer sell tobacco products as commissary items, but act as outlets for exchange tobacco products. He also stated that promotional practices in the military retail system should reflect commercial practices.

The Assistant Secretary of Defense (Health Affairs) concurred with the finding and recommendations and stated that a policy for pricing tobacco products at rates comparable to the civilian sector would send a clearer message for the promotion of a healthy active duty force. See Part I for a summary of management comments and Part III for the complete text of management comments.

Evaluation Response. We consider the Office of the Assistant Secretary of Defense (Force Management Policy) comments to be partially responsive. We believe that the new pricing policy does not reflect the civilian market price structure. We recognize that the recent decision to raise tobacco product prices may impact other grocery and merchandise sales in the military retail system. We agree that analyzing the effects of the new pricing policy should occur before there is another price increase on tobacco products.

Based on management comments, we revised the recommendations to notify Congress of price changes on tobacco products and to adopt commercial promotional practices for the military retail system.

We request that the Assistant Secretary of Defense (Force Management Policy) provide comments on the unresolved and revised recommendations by March 3, 1997.

Table of Contents

Part I - Evaluation Results

Evaluation Background

Risks of Tobacco Use. The increasing rate of lung cancer and other diseases in the United States prompted the initiation of epidemiologic and laboratory studies of the relationship between tobacco use and disease. During the late 1940s and the early 1950s, a number of studies were published that provided a scientific link between smoking and lung cancer. The strength and consistency of the studies, combined with evidence from laboratory and autopsy studies, led to the conclusion in 1957 that smoking caused lung cancer.

Smoking Restrictions. In January 1964, the Surgeon General Advisory Committee on Smoking and Health officially recognized that smoking caused cancer and other diseases. In 1965, Congress enacted the Federal Cigarette Labeling and Advertising Act that required health warning labels on cigarette packs and banned broadcast media advertising of cigarettes. During the 1970s, 31 states passed laws that restricted smoking in public places and private facilities, such as restaurants and workplaces. By 1990, 45 states and the District of Columbia, and at least 51 percent of the cities with populations of 25,000 or greater, had adopted smoking restrictive ordinances for public places. In 1992, Congress passed a statute prohibiting the sale or distribution of tobacco products to anyone under 18 years of age. In August 1996, the Food and Drug Administration issued regulations governing access to and promotion of cigarettes containing nicotine and smokeless tobacco to children and adolescents.

Tobacco Related Mortality. Approximately half of all deaths occurring in the United States are attributable to external factors such as alcohol, dietary habits, illegal drugs, and tobacco. The most prominent external factor that contributes to mortality is tobacco use, accounting for approximately 400,000 deaths each year among U.S. citizens. Smoking significantly contributes to deaths caused by cardiovascular diseases, neoplasms (cancer), and respiratory diseases. On average, each smoker who dies from a smoking-related disease forfeits about 12 years of life compared with his or her nonsmoking counterpart.

Health Care Costs Attributable to Smoking. In 1994, researchers at the Centers for Disease Control and Prevention and the University of California reported on their analysis of data from the 1987 National Medical Expenditure Survey. The researchers reported that the total 1987 medical-care expenditure attributable to smoking was $22 billion. After adjusting smoking attributable percentages to national health care expenditure data, the estimated costs for medical care attributable to smoking in 1993 was $50 billion. The more than twofold increase in estimated direct medical costs meant that for each of the approximately 24 billion packages of cigarettes sold in 1993, approximately $2.06 was spent on medical care attributable to smoking.

Morbidity Costs Attributable to Smoking. In addition to the costs for medical care, the Congressional Office of Technology Assessment estimated in 1990 that indirect morbidity costs were $7 billion and indirect mortality costs

were $40 billion. Indirect morbidity costs are loss productivity costs, such as excessive use of sick leave days. Indirect mortality costs are costs of the economic value of forfeited future earnings for each person who dies prematurely from smoking-related causes.

Evaluation Objectives

The primary evaluation objective was to evaluate the economic impact of the use of alcohol and tobacco in DoD. The objective relating to the impact of alcohol use in DoD will be addressed in a subsequent report.

Another announced evaluation objective was to review the adequacy of the management control program applicable to the primary evaluation objective. We did not review the management control program because the majority of information used in the evaluation was developed and prepared by sources outside DoD and concerned policy decisions rather than control techniques.

See Appendix A for a discussion of the evaluation scope and methodology. See Appendix B for a summary of articles and reports related to the evaluation objective.

Economic Impact of Tobacco Use in DoD

DoD retail system pricing policies encourage high tobacco product sales and are inconsistent with DoD goals for a healthy active duty force. Pricing policies and health care goals are developed independently. In addition, the statute supporting the commissary pricing policy emphasizes low cost to DoD resale system patrons. In FY 1995, DoD retail system tobacco product sales of $747 million generated gross profits and surcharge revenues of about $103 million. In contrast, DoD health care and lost productivity costs attributable to tobacco use were 9 times higher, or about $930 million for the same time period.

Criteria

DoD Directive 1010.10, "Health Promotion," March 11, 1986, establishes a health promotion policy within DoD to improve and maintain military readiness and the quality of life of DoD active duty personnel and other DoD beneficiaries. The policy includes smoking prevention and cessation, and alcohol and drug abuse prevention.

DoD Instruction 1010.15, "Smoke-Free Workplace," March 7, 1994, states that it is DoD policy to protect all DoD civilian and military personnel from the health hazards caused by exposure to tobacco smoke. It bans smoking of tobacco products in all DoD workplaces and designates outdoor smoking areas, when possible. The Instruction requires that the health related consequences of smoking be explained to military personnel at their initial entry into the military. At initial entry, nonsmokers shall be encouraged to refrain from smoking and smokers shall be encouraged to quit.

DoD Regulation 1330.17-R, "Armed Services Commissary Regulations," April 1987, states that merchandise available for resale through the commissary shall be sold at prices to recoup actual cost to include transportation costs in the continental United States (CONUS), Alaska, and Hawaii.

Defense Commissary Agency (DeCA) Directive 40-13, "Merchandising Program," September 1, 1995, states that tobacco sales will be deglamorized. The procedures DeCA uses to deglamorize tobacco include stocking cigarettes at the back of the commissary, prohibiting promotional activities or special off shelf displays, and permitting only those coupons that are available to the general public.

DoD Price Policies Counter DoD Health Care Goals

The pricing policies of the DoD retail system encourage the sale of tobacco products and provide beneficiaries with significant tobacco product savings when compared to the commercial retail market. The pricing policies are inconsistent with DoD goals for a healthy active duty force.

Retail Pricing Policies. The DoD retail system pricing policies enabled DoD outlets to sell cartons of cigarettes at prices up to 76 percent less than the commercial retail market. The DoD retail system includes DeCA, the Army and Air Force Exchange Service (AAFES); the Navy Exchange Service Command; the Marine Corps Exchange; Navy Ships Stores; bowling alleys; military clubs; and various other morale, welfare, and recreation locations.

DeCA Pricing Policy. United States Code, title 10, section 2486, states that commissary merchandise will be priced at a level that will recoup the actual product cost of the item. DoD Regulation 1330.17-R states that commissaries will sell merchandise at cost to include transportation costs in CONUS and a 5 percent surcharge.

Army and Air Force Exchange Pricing Policy. Tobacco products that AAFES retail outlets sell in CONUS are at standard prices established by AAFES Headquarters. AAFES sets the standard retail price to achieve an established profit for each of three cigarette carton pricing levels: premium (highest price), value (medium price), and generic (lowest price). AAFES authorizes individual retail exchange outlets to lower the standard price to be competitive with the local commercial retail market. This is often the case in states with low tobacco excise taxes.

Navy Exchange Service Command and Marine Corps Exchange System. Prices on tobacco products sold in Navy Exchange and Marine Corps Exchange retail outlets in CONUS are based on local market surveys. The surveys include AAFES retail exchange outlets if they are located in the competitive market area. Based on the surveys, cigarette carton prices are adjusted to be competitive with the lowest competitor.

Navy Ships Stores. On November 2, 1992, the Navy raised the price of tobacco products sold in ships stores to match Navy Exchange retail outlet prices. When ships are in port, tobacco product prices match the local Navy Exchange retail outlet price. When ships are more than 3 miles from the coast of the United States, tobacco products are sold at the overseas Navy Exchange retail outlet price. The overseas retail outlet price does not include a Federal excise tax of $2.40 per carton.

Effect of Excise Taxes on Patron Savings. Pricing policies within DoD retail outlets and the varying amounts of state and local excise tax result in a considerable variance in tobacco product patron savings. The cost of tobacco products in commercial retail outlets includes state and local excise taxes. DoD retail outlets are not required to pay state and local excise taxes on tobacco purchases from local distributors. State excise taxes range from $.25 per carton

in Virginia to $8.15 in Washington state. Appendix C lists the excise taxes that the 50 states and the District of Columbia impose on commercial retail outlet tobacco prices.

The following two examples demonstrate the variance in patron savings resulting from the pricing policies and the varying excise tax structures. The standard price of generic brand cigarettes in AAFES exchange outlets is $9.75 per carton. The AAFES exchange outlet at Fort Lewis, Washington, sells a carton of generic brand cigarettes for $9.75 and the commissary sells them for $4.89. The lowest price we found in the commercial retail market was $19.99, resulting in patron savings ranging from $10.24 to $15.10, or from 51 to 76 percent per carton. The AAFES exchange outlet at Langley Air Force Base, Virginia, sold a carton of generic brand cigarettes for $8.50 per carton. The Langley Air Force Base commissary sold a carton of generic cigarettes for $5.75. The lowest price we found in the commercial retail market was $9.29, resulting in patron savings ranging from $.79 to $3.54 per carton.

Patron savings outside CONUS are even greater because tobacco products sold overseas at DoD retail outlets do not include a Federal excise tax of $2.40 per carton. The $2.40 Federal excise tax is included in the price of cigarettes sold in CONUS DoD retail outlets.

DoD Retail System and Commercial Market Tobacco Prices. We compared tobacco product prices at DeCA and DoD exchange outlets in four geographic areas. Commissary tobacco prices were as much as 76 percent less than commercial retail outlet prices. Tobacco prices in DoD exchange outlets were up to 56 percent less than commercial retail outlets. Appendix D shows the average price differentials between the three categories of cigarettes in commercial markets, commissaries, and DoD exchange outlets in the four geographic areas we visited.

The DeCA contracts with the Wirthlin Worldwide Group to perform market basket surveys of merchandise sold in commissaries and commercial grocery stores and supermarkets. DeCA uses the market basket surveys to determine price differences between military commissaries, commercial grocery stores, and supermarkets. The surveys give DeCA management the ability to evaluate policy changes and the effects of pricing strategies. The *1996 Market Basket Price Comparison Study*, published in March 1996, reported that CONUS commissary tobacco savings (without taxes and the surcharge), ranged from 30 to 64 percent compared to commercial grocery store and supermarket prices.

Further Reductions Through Use of Coupons. The use of discount coupons further reduced the retail selling price of tobacco products. Vendor installed coupons added additional savings of as much as $5.00 per carton to patrons who purchased certain brands of cigarettes in the DoD retail system. We visited 46 commissaries and DoD exchange outlets in four geographic areas. At those locations, the percentage of cigarette line items with coupons ranged from 17 percent to 87 percent. At 22 commercial retail outlets in the same areas, the highest percentage of tobacco coupons was 17 percent. That difference was not consistent with the DeCA policy of permitting only coupons that are available to the general public.

DoD Tobacco Product Sales. The DoD retail system tobacco product sales were $747 million in FY 1995. Tobacco products include cigarettes, pipe and cigar tobacco, and smokeless tobacco. The DeCA sales equate to 58 million cartons, or about 70 packs for every 1 of the 8.3 million DoD health care beneficiaries, including children.

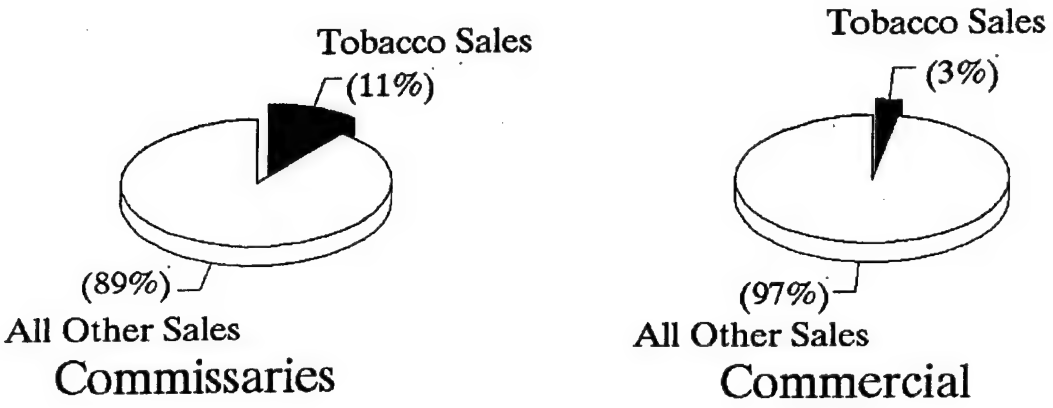
Table 1 shows the total FY 1995 tobacco product sales by the DoD retail system. Tobacco sales at bowling alleys; military clubs; and other morale, welfare, and recreation locations are not included in the table.

Table 1. FY 1995 Tobacco Product Sales
(millions)

Military Retail System	Amount	Surcharge or Gross Profit	Number of Sales Outlets[1]
DeCA[2]	$ 459.7	$ 23.0[3]	230
AAFES	149.5	39.2	906
Navy Exchange Service Command	104.8	30.8	425
Marine Corps Exchange	26.2	8.1	112
Navy Ships Stores	7.2	1.9	218
Total	**$ 747.4**	**$ 103.0**	**1,891**

[1]Includes all commissaries, exchanges, smaller convenience stores, and package stores.
[2]Includes all commissaries at Army and Air Force installations and four commissaries at Navy installations. Navy commissaries do not sell tobacco products to preclude competition with Navy Exchange Service Command.
[3]Represents surcharge collections of 5 percent.

Commissary Tobacco Product Sales. Cigarette sales in commissaries were about 62 percent of the total DoD tobacco sales in FY 1995. Those sales were about 11 percent of the total retail sales of $4.2 billion for the 230 commissaries that sold tobacco products. As shown in the Figure, tobacco product sales at commissaries were significantly higher than the average tobacco sales for commercial grocery stores and supermarkets.



Comparison of 1995 Tobacco Sales for Commissaries and Commercial Grocery Stores and Supermarkets

About half of the 230 commissaries had tobacco sales greater than 10 percent of their total retail sales. Appendix E shows 20 CONUS commissaries that had tobacco sales of 20 percent or more of their total retail sales in FY 1995. In Europe, four commissaries had tobacco sales greater than 20 percent of their total retail sales. For example, tobacco sales at the Fort McCoy, Wisconsin, commissary accounted for 49 percent of total retail sales in FY 1995. Dividing the 265,000 cartons of cigarettes sold by the 83,019 customer transactions shows that more than 3 cartons of cigarettes were sold per transaction.

DoD Smoking Reduction Goals. Although DoD pricing policies encourage the sale of tobacco products, DoD recently adopted goals to reduce tobacco use and encourage a healthier workforce. In 1991, the United States Public Health Service disseminated the *Healthy People 2000* objectives. The objectives are baseline reference points for assessing progress toward preventing unnecessary disease and disability and achieving a better quality of life for all Americans. Two of the *Healthy People 2000* objectives that the Assistant Secretary of Defense (Health Affairs) adopted for DoD were reducing cigarette smoking to a prevalence of no more than 20 percent among military personnel and reducing the use of smokeless tobacco among males aged 24 and younger to no more than 4 percent.

Tobacco Use in DoD. At the direction of the Assistant Secretary of Defense (Health Affairs), the Research Triangle Institute, Raleigh, North Carolina, published six surveys since 1980 that investigated the prevalence of alcohol, illicit drugs, and tobacco use among active-duty personnel. The surveys also commented on the negative consequences associated with substance use. The *1995 Department of Defense Survey of Health Related Behaviors Among Military Personnel* (the Survey), December 1995, reported that 31.9 percent of active-duty personnel are cigarette smokers (60 percent higher than the 20 percent DoD goal) and that 15 percent are "heavy" cigarette smokers. The Survey stated that smokers are those who have smoked cigarettes in the

past 30 days. Heavy smokers are those who smoked one or more packs (a pack contains 20 cigarettes) per day, during the past 30 days. The level of current smokeless tobacco use for all active-duty male personnel, aged 18 to 24, is 21.9 percent (about 450 percent higher than the 4-percent DoD goal). As shown in Table 2, the prevalence of smokers and heavy smokers declined between 1980 and 1995.

Table 2. Trends in Cigarette Use, 1980 and 1995

Service	1980 (percent)	1995 (percent)
Army		
Any Smoking	54.3	34.1
Heavy Smoking	35.2	17.0
Navy		
Any Smoking	53.8	34.9
Heavy Smoking	37.3	16.3
Marine Corps		
Any Smoking	53.4	35.0
Heavy Smoking	34.5	15.0
Air Force		
Any Smoking	43.2	25.1
Heavy Smoking	29.7	11.2
Total DoD		
Any Smoking	**51.0**	**31.9**
Heavy Smoking	**34.2**	**15.0**

Percentages for any smoking and heavy smoking were not adjusted for age, educational attainment, marital status, race and ethnicity, or sex.

Cessation of Smoking in DoD. The Survey attributes the significant decline in cigarette smoking to societal trends and the increased emphasis on smoking cessation and prevention within DoD. Although cigarette smoking has declined in DoD, the prevalence of current cigarette smoking is still greater among military personnel than civilians. Table 3 shows that current smoking rates in the Army, the Navy, and the Marine Corps were usually higher than comparable civilian populations. Air Force current smoking rates were usually lower than the civilian rates.

Table 3. Comparison of Cigarette Smoking Among Active Duty Personnel and Civilians*
(in percent)

Sex and Age Group	Civilian	Army	Navy	Marine Corps	Air Force
Males					
18 to 25	36.6	42.7	40.0	45.1	34.1
26 to 55	28.4	30.4	35.1	24.7	22.1
18 to 55	31.9	36.3	37.0	37.3	26.2
Females					
18 to 25	28.6	30.2	32.1	35.4	29.7
25 to 55	24.5	28.1	28.1	21.9	21.3
18 to 55	26.5	29.1	30.0	30.1	25.1
Total					
18 to 25	**35.5**	**41.0**	**39.0**	**44.7**	**33.2**
26 to 55	**27.9**	**30.1**	**34.5**	**24.6**	**22.0**
18 to 55	**31.3**	**35.4**	**36.3**	**37.0**	**26.0**

*Estimates are adjusted to consider demographic differences between the military and civilian populations. Civilian information was standardized to the demographic distribution of the active duty population by age, marital status, race and ethnicity, and sex.

Smokeless Tobacco. According to the Survey, approximately 13 percent of all military personnel used smokeless tobacco in 1995. Nearly 22 percent of males ages 18 through 24, reported smokeless tobacco use, but only 5.5 percent of those ages 35 and older reported such use. Comparisons among the Services showed that personnel in the Marine Corps had the highest prevalence of smokeless tobacco use (24 percent) and those in the Air Force had the lowest (8 percent).

Financial Impact of Smoking

The DoD realized gross profits and surcharge revenues of $103 million from the sale of tobacco products in FY 1995. Those revenues were 11 percent of the DoD health care and lost productivity costs.

DoD Health Care Cost. DoD health care and lost productivity costs attributed to tobacco use were about $930 million during FY 1995. Health care costs attributable to smoking were about $584 million for beneficiaries from 35 through 85 years old. The health care costs do not include expenditures for illnesses related to smokeless tobacco use. The additional cost of lost active

duty productivity was about $346 million. Table 4 shows the DoD health care costs for 1995 as estimated by the Air Force 81st Medical Groups Clinical Research Laboratory (the Laboratory), Keesler Air Force Base, Mississippi.

Table 4. DoD Health Care Costs Attributable to Smoking

Type of Cost	Age Groups: Ages 35 through 64	Ages 65 through 85+	Total
Hospitalization	$ 342,983,044	$ 109,998,117	$ 452,981,162
Medications	17,754,623	3,580,077	21,334,700
Nursing Home	716,678	2,909,366	3,626,044
Other Professional	479,194	1,600,841	2,080,035
Physician Fees	82,497,498	21,944,871	104,442,369
Total	**$ 444,431,037**	**$ 140,033,272**	**$ 584,464,310**

The Laboratory estimated that health care costs attributable to smoking were $584 million in FY 1995. Health care costs attributable to tobacco were the cost of hospitalization, physician's fees, nursing home, medications, and other professional services. Personnel at the Laboratory used demographic information from the FY 1995 DoD beneficiary population and medical treatment facility usage rates for personnel with smoking related diseases. The Laboratory also used FY 1995 DoD health care costs and DoD beneficiary mortality rates to estimate health care costs attributed to tobacco use. A discussion of the demographic information and health care costs that the Laboratory used is in Appendix A.

Lost Productivity. In 1995, the estimated lost productivity cost to DoD was $346 million. Lost productivity costs was time lost due to "smoke breaks" and the payment of active duty salaries for days of hospitalization attributed to smoking related illnesses.

Smoke Breaks. Smoke breaks by active duty personnel cost DoD an estimated $345 million in lost productivity in FY 1995. The estimate did not include the cost of smoke breaks for civilian personnel. Using only the heavy smokers in the DoD active duty force (about 228,000) and applying a weighted average of active duty personnel costs to one-half hour of smoke breaks per day (estimated by the Laboratory), the estimated cost of lost productivity among DoD active duty personnel was $345 million.

Lost Productivity of Active Duty Due to Hospitalization. Using the primary diagnostic codes, we estimated that DoD incurred $1 million in lost productivity costs for active duty personnel hospitalized for diseases attributable to smoking. The figure was calculated by multiplying the number of active duty occupied beddays by the daily weighted average active duty personnel cost.

The Laboratory determined that over 200,000 hospital beddays were required for health care of diseases attributable to smoking. About 9,200 of the hospital beddays were for active duty personnel. That figure was derived by using only the primary diagnosis, although tobacco related diseases are often coded as a secondary or tertiary diagnoses. As a result, the effect of tobacco related diseases treated by the DoD health care system are understated.

We were unable to estimate the value of lost productivity attributable to outpatient visits for preadmission and postadmission absences from duty due to illnesses attributable to smoking because the DoD health care system did not collect that information.

Pricing Policy Versus Health Promotion Policy

The tobacco pricing policy of the DoD retail system is not consistent with the DoD health promotion policy. Although the pricing policy encourages high sales of tobacco products, the health promotion policy states that DoD Components shall emphasize primary prevention practices that will motivate DoD personnel not to start smoking, as well as motivate users to quit smoking. Pricing policies of the DoD retail system and health care goals disseminated by the Assistant Secretary of Defense (Health Affairs) are developed independently.

Management Initiative

On August 23, 1996, the Assistant Secretary of Defense (Force Management Policy) announced that tobacco products in commissaries would be sold at higher prevailing DoD exchange outlet prices. The purpose of the price increase was to discourage consumption of tobacco products. As part of the announcement, the Assistant Secretary of Defense (Health Affairs) stated that a reduction in consumption of a few percentage points will reduce lost time and the related costs to treat medical problems associated with tobacco use.

Conclusion

The DoD is sending a mixed message to its beneficiary population. The DoD retail system encourages the sale and use of tobacco products through pricing policies that provide tobacco products at significant savings. Conversely, DoD supports the *Healthy People 2000* goal of achieving an active duty smoking rate of 20 percent by the year 2000 and is striving to reduce health care costs.

About 80 to 90 percent of cigarette smokers start smoking by the age of 21. Table 3 shows that the 18 through 24 age group has the most prevalent smokers of all active duty personnel. While we recognize that price is only one of several factors affecting the use of tobacco products, the Centers for Disease Control and Prevention estimated that for every 10 percent increase in price, there will be a 4-percent reduction in tobacco consumption. In our opinion, DoD can achieve significant savings in health care and productivity expenses by adopting a civilian pricing structure for tobacco products. An increase in the price of tobacco products would benefit DoD in two ways. It would ultimately provide a reduction in DoD health care costs for illnesses attributable to tobacco use; and it would reduce the smoking prevalence rates for price sensitive young enlisted personnel. Such a pricing structure would result in a reduced demand for tobacco products by DoD beneficiaries and would reduce the years of potential life lost as shown in Appendix F.

The August 23, 1996, initiative by the Assistant Secretary of Defense (Force Management Policy) is a positive step in correcting the inconsistency between the DoD tobacco pricing policy and the objectives of the DoD health care system. However, we believe that DoD should go further in its pricing efforts to reduce tobacco product consumption. Prices for tobacco products should be set at prevailing commercial retail outlet levels, not at DoD exchange outlet price levels. DoD should not encourage tobacco sales through discounted prices when the DoD health community is striving to reduce the effects of tobacco on the active duty force and its beneficiary population.

Recommendations, Management Comments, and Audit Response

Revised Recommendations. As a result of management comments and additional review, we revised draft Recommendations 2. and 3.

1. We recommend that the Assistant Secretary of Defense (Force Management Policy) establish policy requiring prices for tobacco products sold in DoD retail outlets to be equivalent to prices at local commercial retail outlets.

Assistant Secretary of Defense (Force Management Policy) Comments. Executive Director, Morale, Welfare, Recreation and Resale activities in the Office of the Assistant Secretary, partially concurred with the recommendation, stating that on November 1, 1996, commissaries became outlets for the sale of tobacco products and that prices were increased to the prevailing exchange price. He stated that prices should continue to be set by the exchanges and not on an attempt to identify and match a targeted high or low commercial price. He also stated that all retail items are guaged to reflect civilian market prices but do not consistently attain parity.

He stated, the pricing policy would be difficult to implement in overseas markets and would place military service members at a disadvantage because local commercial tobacco costs are typically much higher than in the United States. Finally, He stated that a change in current policy can be considered after the effect of the recent price increase is determined.

Assistant Secretary of Defense (Health Affairs) Comments. The Assistant Secretary concurred with the finding and recommendations, stating that he has supported pricing tobacco product sales at rates comparable to the civilian sector since the early eighties. He stated that a change in the DoD tobacco pricing policy will send a clearer message for the promotion of a healthy active duty force.

Evaluation Response. The actions that raised prices of tobacco products in commissaries is an excellent first step. However, we disagree with the statement, "all retail items are guaged to reflect the prevailing civilian market price but do not necessarily consistently attain parity." The recently implemented policy of raising tobacco prices in commissaries created a price balance between military exchange outlets and commissaries. However, the new pricing policy still does not recognize the effect of the varying amounts of state and local excise taxes or sales taxes in patron savings, and as a result, does not reflect the prevailing civilian market price structure.

AAFES sets standard CONUS tobacco product prices to achieve an established gross profit, per carton, for three cigarette pricing tiers. AFFES exchange outlets are authorized to lower the set standard price in states with low excise taxes to be competitive with the local commercial retail market. However, AFFES standard prices are not adjusted in states with high excise taxes.

Before implementation of the new policy, commissary tobacco prices were as much as 76 percent lower than commercial retail outlet prices in the northwest. After implementation of the new pricing policy, tobacco prices in the military retail system were as much as 51 percent less than commercial retail outlet prices. Additional savings are available to patrons of the military retail system because state sales taxes are not imposed on cigarettes or other merchandise.

We prepared a tobacco product price comparison to illustrate that the new tobacco price structure in the military retail system does not reflect the prevailing civilian market. Table 5 shows the percentage of savings available to military patrons in the four geographic regions we visited.

Table 5. Comparison of Cigarette Prices

Region and Class of Cigarettes	Commercial Outlet Price*	Military Outlet Price	Price Difference	Percent Savings
Northeast				
Premium	$ 13.55	$ 13.55	$ 0	0
Value	11.89	9.00	2.89	24
Generic	10.39	8.75	1.64	16
Northwest				
Premium	25.99	15.00	10.99	42
Value	22.49	12.00	10.49	47
Generic	19.99	9.75	10.24	51
Tidewater, Virginia				
Premium	14.17	13.15	1.02	7
Value	11.17	9.25	1.92	17
Generic	9.29	8.50	.79	9
Northern, Virginia				
Premium	13.89	13.00	.89	6
Value	11.49	9.00	2.49	22
Generic	9.00	7.00	2.00	22

*Commercial outlet prices do not include sales taxes

The Director also stated that implementation of the recommendation overseas would place military service members at a disadvantage because local commercial tobacco costs are typically much higher than in the United States. We never intended for personnel in the military retail system to set overseas prices based on overseas commercial prices. The intent of the recommendation was for DoD to use the prices for tobacco products within the CONUS retail system at overseas military retail locations.

We continue to believe that DoD should not encourage tobacco sales through prices discounted below commercial prices, and that a price increase to or near the levels in the commercial marketplace is warranted. We also recognize that the recent DoD decision to raise tobacco product prices in commissaries may affect other grocery and merchandise sales in the military retail system. We believe that 1 year is sufficient for DoD to measure and evaluate the effect of the recently announced tobacco price increase to determine whether full implementation of the recommendation is justified. However, we agree that before another price increase is levied, the effect of the November 1996 price increase on tobacco products should be analyzed.

2. We recommend that the Assistant Secretary of Defense (Force Management Policy) notify Congress of its intent to change tobacco product prices in the military retail system.

Assistant Secretary of Defense (Force Management Policy) Comments. The Office of the Assistant Secretary nonconcurred with the recommendation and requested that the recommendation be withdrawn because tobacco products are no longer sold as a commissary item.

Evaluation Response. The intent of our recommendation was for DoD to request congressional approval if tobacco product prices were to be set at a level above cost. Based on management's comments, we revised the recommendation for DoD to notify Congress of any changes in pricing policies for tobacco products. We request that the Assistant Secretary comment on the revised recommendation.

3. We recommend that the Assistant Secretary of Defense (Force Management Policy) ensure the DoD retail system adopts promotional practices for tobacco products that reflect commercial practices.

Assistant Secretary of Defense (Force Management Policy) Comments. The Office of the Assistant Secretary partially concurred with the draft recommendation, stating, "promotional practices in the military retail system should reflect commercial practices," and suggested the recommendation be revised to state that the DoD promotional practices reflect commercial practices.

Evaluation Response. The comments were responsive to the intent of the recommendation, and we revised the recommendation to reflect his comments. We request that the Assistant Secretary in response to the final report, provide detailed information on plans to ensure that promotional practices within the military retail system reflect commercial practices. We also request an implementation date for the planned actions.

Part II - Additional Information

Appendix A. Evaluation Process

Scope

We obtained and reviewed 78 articles and reports related to the use of tobacco products that were issued between 1986 and 1996. We selected 33 of the 78 articles and reports that we determined to be applicable to the evaluation objectives. Appendix B summarizes the 33 articles.

We also obtained tobacco pricing and sales information from DeCA, AAFES, the Navy Exchange Command, and Navy Ships Stores. The sales information included sales from commissaries, exchanges, ships stores, and shoppettes. We did not include sales information for vending machines and other morale, welfare, and recreation locations because of the different methods the Services used to capture and report sales information.

Evaluation Period. We performed this evaluation from April through September 1996.

Methodology

Use of Computer-Processed Data. We relied on computer-processed data contained in four DoD data bases. The Defense Medical Information Summary System contains summary level data concerning expense, medical utilization, and work load information as reported by DoD medical treatment facilities. International Classification of Diseases, 9th Revision codes and lengths of patient stay were obtained from the Retrospective Case-Mix Analysis System for an Open System Environment. The Retrospective Case-Mix Analysis System for an Open System Environment data base provides data concerning cost, utilization, and work load.

DoD health care costs for FY 1995 were obtained from Medical Expense and Performance Reporting System. The Medical Expense and Performance Reporting System data base provides monthly expense and workload information for medical treatment facilities.

The Civilian Health and Medical Program of the Uniformed Services data base provides claim level information for care provided outside the DoD medical treatment facilities. The Civilian Health and Medical Program of the Uniformed Services pays the health care cost of active duty dependents, retirees, retirees' dependents, dependents of deceased active-duty, and retired

personnel under age 65, when treated by civilian providers. We did not validate the four data bases because of the evaluation resources that would have been required to accomplish that effort and because it was beyond our evaluation objective.

Healthcare cost and demographic information from the DoD data bases was applied to a computerized model developed by the Centers for Disease Control and Prevention. The model estimates the economic impact of smoking for the DoD healthcare system.

We considered neither the effect that premature deaths from smoking have on lifetime healthcare costs nor the additional healthcare spending that would be required on a longer living elderly population that would result from reduced levels of smoking.

Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC). The SAMMEC computer software model was developed in 1987 by personnel at the Minnesota Department of Health. SAMMEC has been updated three times under sponsorship of the U.S. Department of Health and Human Services Centers for Disease Control and Prevention. The SAMMEC model uses economic cost data, mortality data, and smoking prevalence data for large populations to estimate the disease impact of smoking on a population.

The Air Force 81st Medical Group Clinical Research Laboratory used the SAMMEC computer software model, which has been used internationally and by all 50 states for the last 10 years, to produce estimates of mortality attributable to smoking and years of potential life lost. SAMMEC estimates the number of smoking related deaths, for persons 35 years old and older, by using formulas based on smoking attributable risks for certain conditions among current and former smokers. The smoking attributable risk factors from SAMMEC were also applied to the number of occupied beddays for each International Classification of Diseases, 9th Revision code to determine the smoking attributable length of stay in military medical treatment facilities.

Smokers are at increased risk for multiple diseases from three major categories, cardiovascular diseases; neoplasms (cancer); and respiratory diseases. Risk factors attributable to smoking are the proportion of cases of disease or deaths that can be regarded as linked to cigarette smoking. For each smoking related diagnosis, the smoking attributable risk represents the proportion by which the mortality would be reduced if smoking were eliminated. Risk factors attributable to smoking are shown in Appendix G.

Specific smoking rates are known only for active duty personnel. Therefore, nationwide civilian smoking rates were used in estimating the health care costs of DoD retiree and dependent personnel attributable to smoking. The use of nationwide civilian rates may have resulted in a lower estimate of DoD health care costs because DoD military personnel have historically used tobacco products at a higher rate than their civilian counterparts.

Organizations Visited or Contacted

Contacts During the Evaluation. We visited or contacted individuals at 38 organizations within DoD and 6 other Government organizations. Further details are available on request. We also visited the following non-Government organizations.

- o American Cancer Society
- o Institute for Health and Aging, University of California
- o National Center on Addiction and Substance Abuse, Columbia University
- o Research Triangle Institute
- o Vector Research, Incorporated

Appendix B. Tobacco Articles and Reports

The following is a summary of articles and reports related to the evaluation objective.

"Cigarette Taxes are Good For Your Health," *Washington Post*, September 11, 1996. The article discussed research reported by Duke University economist, Michael Moore, in the Rand Journal of Economics. Based on data from 1954 through 1988 on changes in tobacco taxes and mortality rates in the United States, Moore found that a 10-percent increase in cigarette taxes appears to result in a 5 percent decline in smoking.

"The Tobacco Road," *U.S. News and World Report,* February 5, 1996. The article highlights information released by the Centers for Disease Control and Prevention. Each year, tobacco kills more than 400,000 people and costs $50 billion in health care. Of the 10 states with the lowest cigarette taxes, 8 have higher than average rates of adult smoking. Similarly, 7 of the 10 places with the highest excise taxes on cigarettes have lower than average smoking rates. Cigarette excise taxes range from $0.25 in Virginia to $8.15 per carton in Washington state.

"Tobacco Use Habits of Naval Personnel During Desert Storm," B. L. Forgas, D. M. Meyer, M. E. Cohen, *Military Medicine*, 1996, Vol. 161, No. 3. That study used surveys to examine the tobacco use habits of Naval personnel during Desert Storm. Survey respondents included 34.1 percent who said they were current smokers, and 23.8 percent who used smokeless tobacco. While deployed to Desert Storm, 7 percent started smoking (4.7 percent overall increase) and 9.3 percent started using smokeless tobacco (6.1 percent overall increase). The most frequently cited reasons to start or increase the use of tobacco products were stress and boredom. Additionally, tobacco products were easily and inexpensively accessible.

"Prevalence of Tobacco Use Among First-Term Air Force Personnel Before and After Basic Military Training," L. Williams, G. Gackstetter, E. Fiedler, C. Hermesch, and H. Lando, *Military Medicine*, 1996, Vol. 161, No. 6. The authors reported that prohibition of tobacco use during basic military training had a positive effect in reducing tobacco use within the first 90 days following training. The authors reported that 24 percent of the previous smokers did not resume smoking within 90 days after basic military training. The authors stated that in addition to forced tobacco cessation during basic military training, other intervention methods are needed to further reduce tobacco use after training is completed.

"Trends in Alcohol, Illicit Drug, and Cigarette Use Among U.S. Military Personnel: 1980-1992," Robert M. Bray, Larry A. Kroutin, and Mary Ellen Marsden, *Armed Forces & Society*, Winter 1995, Vol. 21, No. 2. The authors used the Worldwide Surveys on Substance Abuse among Military Personnel to evaluate the trends for 1980 through 1992. The evaluation showed a steady and

notable reduction in alcohol consumption and cigarette use, but less of a decline in heavy drinking. Further reductions of smoking and heavy drinking remain the major substance abuse challenges for the military in the 1990s.

"Preliminary Estimates From the 1994 National Household Survey on Drug Abuse," produced by the Substance Abuse and Mental Health Services Administration, Office of Applied Studies, September 1995, Advance Report Number 10. The survey is the primary source of statistical information on the use of illegal drugs in the United States. It is based on a national representative sample of the civilian noninstitutionalized population age 12 and older. Each year, the survey produces estimates of the prevalence of use of various substances, including a variety of illicit drugs, alcohol, and tobacco. In 1994, 60 million people smoked cigarettes and 13 million Americans had five or more drinks per occasion on 5 or more days in the month.

"Financial Toll of Substance Abuse Studied," *Modern Healthcare*, February 20, 1995. The article references a study performed by the Center on Addiction and Substance Abuse at Columbia University, New York. The study reported that smoking, drinking, and drug addiction would cost the Federal Government $77.6 billion in FY 1995, 20 percent of what would have been spent on entitlement and welfare programs. In addition, tobacco accounts for 65 percent of all substance-abuse costs.

"Cigarette Taxation and the Social Consequences of Smoking," W. Kip Viscusi, Duke University, November 1, 1994. The paper examines the social consequences of smoking for the smoker and for society at large. In addition, the paper compares the financial costs of smoking, including the costs of second-hand tobacco smoke to cigarette taxation. The article concludes that cigarette taxes exceed the associated costs of smoking.

"A Working Model for Predicting the Consumption and Revenue Impacts of Large Increases in the U.S. Federal Cigarette Excise Tax," Jeffrey E. Harris, July 1994, National Bureau of Economic Research Working Paper Series No. 4803. The report describes a model that is based on the demand relationship between cigarette prices and cigarette consumption in the United States. The model is used to predict the revenue that would result from using Federal excise tax increases ranging from $0.45 to $1.76 per pack of cigarettes. The report discusses the model, but not the actual effect of tax increases.

"The Potential Costs and Benefits of Selected Components of Comprehensive School Health Education Programs," Rothman, Ehreth, Palmer, Collins, Reblando, and Luce, for Battelle, April 15, 1994. The study estimated the potential individual and combined costs and benefits of selected components of a comprehensive school health education program. The researchers reported that the avoided lifetime costs of smoking were an estimated $10,865 per adolescent.

"The Human Cost of Tobacco Use," Carl E. Bartecchi, Thomas D. MacKenzie, and Robert W. Schrier, *The New England Journal of Medicine*, March 31, 1994, Vol. 330, No. 13. The article reviews the overall human cost of tobacco use. It is estimated that during the 1990s in developed countries, tobacco will cause approximately 30 percent of all deaths among those 35 to 69 years of age,

making it the largest single cause of premature death in the developed world. Tobacco is the leading cause of preventable death. In 1990, tobacco was responsible for approximately 400,000 deaths in the United States.

Memorandum, "Tobacco-Free Air Force," and attached implementation plan, July 14, 1993. The memorandum, issued by Headquarters, U.S. Air Force, sets forth policy for a tobacco-free Air Force. The implementation plan implements policies to decrease the number of tobacco users with the overall goal of a tobacco-free Air Force. The plan includes goals and benchmarks to measure the Air Force performance in meeting a tobacco-free goal.

"Predictors of Basic Infantry Training Success," R. O. Snoddy, *Military Medicine*, 1994, Vol. 159, No. 9. The study attempted to identify predictors of basic infantry training success with 649 male trainees in a 13-week cycle of basic and advanced infantry training at Fort Benning, Georgia. The study reported that the strongest predictors of the medical effect on training were a history of cigarette smoking and the trainees initial performance on the Army physical fitness test. The authors recommended that when selecting recruits, the military consider cigarette smoking a negative factor, and that recruits be required to meet a standard of fitness before induction.

"Smoking-Related Deaths and Financial Costs: Office of Technology Assessment Estimates for 1990," Congressional Testimony before the Senate Special Committee on Aging, Hearing on Preventive Health: An Ounce of Prevention Saves a Pound of Cure, revised, May 6, 1993. At the request of the Senate Special Committee on Aging, personnel from the Office of Technology Assessment assessed the extent of smoking-related deaths and overall financial costs for 1990 and developed estimates of the smoking-related health care costs borne by the Federal Government through Medicare, Medicaid, and other Government financed programs. They estimated the total financial cost of smoking in 1990 to be $68 billion or $2.59 per pack of cigarettes sold in the United States. In 1990, the Federal, state, and local Governments together funded approximately $8.9 billion of smoking attributable direct costs.

"Use of Smokeless Tobacco Among Adults - United States, 1991," *Morbidity and Mortality Weekly Report*, April 16, 1993, Vol. 42, No. 14. The use of smokeless tobacco was highest among young males. The article states, that nearly one-fourth of current smokeless tobacco users also smoke cigarettes. The article concluded with a discussion of the national health objectives for the year 2000 concerning the reduction of the prevalence of smokeless tobacco use and strategies to lower the level of use to meet the goals.

"The Effects of Alcohol and Tobacco Use on Troop Readiness," V. Zadoo, S. Fengler, and M. Catterson, *Military Medicine*, 1993, Vol. 158. The study examined the effects of alcohol and tobacco use on soldier readiness (performance on Army physical fitness test, sick call visits, and time away from duty). The authors concluded that cigarette smoking has a detrimental effect on athletic performance. They did not, however, find a measurable effect of alcohol consumption and cigarette smoking on soldiers going to sick call or spending time away from duty.

"Economic Implications of Smoking Cessation Therapies: A Review of Economic Appraisals," Cohen and Fowler, *PharmacoEconomics*, 1993, Vol. 4. The article highlights the debate about whether lifetime medical costs are lower for nonsmokers than for smokers, and presents evidence on both sides that relate to the issue of resource savings versus additional healthcare resources used if former smokers live longer. The authors concluded that studies of economic implications of smoking cessation therapies should include both the savings in lifetime healthcare costs from reduced smoking, and the additional healthcare spending on a longer-living elderly population.

"The Effect of State Cigarette Tax Increases on Cigarette Sales, 1955 to 1988," Dan E. Peterson, Scott L. Zeger, Patrick L. Remington, and Henry A. Anderson, *American Journal of Public Health*, January 1992, Vol. 82, No. 1. The authors evaluated the effect of state cigarette tax increases on cigarette sales in 50 states, from 1955 to 1988. The authors analyzed the changes in cigarette consumption following state cigarette tax increases and reported the amount of the change in cigarette consumption by the size of the tax increase. On average, cigarette consumption declined for each increase in state cigarette taxes. The authors reported that from 1955 to 1988, larger tax increases were associated with larger declines in consumption. The authors concluded that raising cigarette taxes appeared to be an effective public health intervention that could reduce cigarette consumption and its associated health consequences.

"Report of the Tobacco Policy Research Study Group on Tobacco Pricing and Taxation in the United States," David Sweanor, Scott Ballin, Ruth D. Cocoran, and others, *Tobacco Control*, 1992, Vol. 1. The article discusses the taxation of tobacco products in the United States and the effects of price changes on the demand for tobacco products. It stated that price is the single most effective way to reduce tobacco use. It also stated that additional research is needed to fully understand the effect of taxation and price changes on demand.

"Smoking, Exercise, and Physical Fitness," Terry Conway and Terry Cronan, *Preventive Medicine*, 1992, Vol. 21. The article presents research on the effects of smoking on physical fitness on a randomly selected sample of 3,045 Navy personnel. Findings indicated that current smokers engage in fewer exercise sessions per week; exercise for shorter time periods; and overall, expend fewer kilocalories per week in exercise activities than do former smokers or those who have never smoked. There is a negative association between tobacco use and physical endurance, both cardiorespiratory and muscular, even after differences in the average exercise levels of smokers and nonsmokers are taken into account.

"Smoking and Health in the Americas - A 1992 Report of the Surgeon General," in collaboration with the Pan American Health Organization. In 1992, the authors estimated that total lifetime excess medical care costs for smokers exceeded those for nonsmokers by $501 billion, an average of over $6,000 per current or former smoker.

"Cigarette Smoking and Lifetime Medical Expenditures," Thomas A. Hodgson, National Center for Health Statistics, The Milbank Quarterly, 1992, Vol. 70.

The article presents results from a study to estimate and compare lifetime medical expenditures of smokers and those who have never smoked. The article includes discussions, graphs, and charts showing that the cumulative medical care required by smokers at all ages while alive, outweighs shorter life expectancy, and smokers incur higher expenditures for medical care over their lifetimes than those who have never smoked.

"Tobacco Use Programs at Navy Commands: 1990 Survey Results," Terry L. Conway, Suzanne L. Hurtado, and Susan I. Woodruff, Naval Health Research Center, Health Services Research Department, September 28, 1990, Report No. 90-28. The report provides results of a study regarding the implementation of Navy policy on tobacco use, and documents the extent to which tobacco prevention and cessation programs and activities are being conducted at commands throughout the Navy. The authors recommended that all Navy commands take a more active role in motivating tobacco users to make serious quit attempts, with special efforts directed toward sea commands. The authors also recommended developing standardized guidelines for Navy health care providers to help patients stop using tobacco, to include a standardized system for quickly identifying tobacco users.

"The Costs of Smoking and the Cost Effectiveness of Smoking Cessation Strategies," A. Elixhauser, *Journal of Public Health Policy*, Summer 1990. The article summarizes the evidence on the direct and indirect costs associated with smoking, and the potential savings that result from stopping smoking. In 1984, the total estimated direct cost (health care expenditures) of smoking in the United States was $23.3 billion. The indirect costs (absenteeism, premature disability, and premature death) were $30.4 billion.

"Measuring Medical Cost and Life Expectancy Impacts of Changes in Cigarette Sales," Barbara C. Lippiatt, M.A., *Preventive Medicine*, 1990, Vol. 19. The article presents a model for use in evaluating changes in policy relating to smoking and the resulting effects on medical costs and life expectancy. The model uses price elasticity values developed by Lewit and Coate. Applying the Lewit and Coate model, the authors showed that a decrease in cigarette sales increases years of life expectancy and medical costs. Medical costs increase because quitters incur added costs over their extra years of life. The model showed that the tradeoff between life expectancy and increased medical costs is insignificant.

"Success in Basic Combat Training: The Role of Cigarette Smoking," Gregory H. Blake and John A. Parker, 1990. The article presents results from a study to determine whether cigarette smoking affected a soldier's ability to complete basic combat training. The smoking group was comprised of 339 soldiers, and the nonsmoking group was comprised of 535 soldiers. The authors reported that those soldiers who smoked one or more packs of cigarettes per day were at a greater risk for failing basic combat training.

"The Taxes of Sin - Do Smokers and Drinkers Pay Their Way?", Willard G. Manning, Emmett B. Keeler, Joseph P. Newhouse, Elizabeth M. Sloss, and Jeffrey Wasserman, prepared for The National Center for Health Services Research and Health Care Technology Assessment, March 1989. The article

presents the results of a study to determine the external cost of smoking and alcohol consumption. The external costs are the costs that are borne by society. A discount range of 0 percent to 10 percent was applied to the costs. At a discount rate of 5 percent, the external cost of smoking is $0.15 per pack. The external cost of alcohol consumed in excess of two drinks per day is $1.19 per excess ounce of alcohol consumed. The study showed that smokers pay their way, but drinkers do not.

"The Health Consequences of Smoking - Nicotine Addiction, A Report of the Surgeon General," May 1988. The report reviews evidence that tobacco use is addicting and that nicotine is the active pharmacologic agent of tobacco that causes the addictive behavior. The addictive properties of cigarette smoking and tobacco use is comparable to those of heroin and cocaine use. The report concluded that by understanding the addictive properties of nicotine, health care providers may be able to assist tobacco users in quitting.

"Tobacco Use and Performance on the U.S. Army Physical Fitness Test," M. S. Bahrke, T. S. Baur, D. F. Connors, *Military Medicine*, 1988, Vol. 153, No. 5. The article reports the results of three studies that tested the relationship of cigarette smoking, smokeless tobacco use, and level of motivation to performance on the Army physical fitness test. Cigarette smoking had a detrimental effect on physical performance. The authors also reported that smokers had lower levels of motivation than nonsmokers, and that habitual use of smokeless tobacco was associated with declining physical performance.

"Health and Economic Implications of a Tobacco-Free Society," Kenneth E. Warner, *Journal of American Medical Association*, October 16, 1987, Vol. 258, No. 15. The article identifies the health and economic implications of a tobacco-free society. The author presents the arguments of the tobacco industry (economic contributions of tobacco), and the anti-tobacco community (health care costs from tobacco use). Elimination of tobacco from society would increase life expectancy and reduce health care spending on smoking-related illness. It would also likely increase health care spending on an increased elderly population. The author concluded, "The economic impacts of a tobacco-free society would be modest and of far less consequence than the principal implication: a significantly enriched quality and quantity of life."

"Some Thoughts on Health Promotion in the United States Army," Joseph M. Rothberg, Ph.D., prepared for the Inter-University Seminar on Armed Forces and Society Biennial Conference, Chicago, Illinois, October 8-10, 1987. The paper addresses the Army health promotion program, "Fit to Win." The program includes anti-tobacco and alcohol and drug abuse prevention and control components. Fit to Win was designed to modify individual behaviors that keep the group from being maximally fit. An assessment on the program effectiveness on readiness, combat efficiency, and work performance had not and could not be performed until the Army developed baseline rates targeted by the program.

"The Social Security Cost of Smoking," John B. Shoven, Jeffrey O. Sundberg, and John P. Bunker, Presentation at the National Bureau of Economic Research

Conference on the Economics of Aging, March 19-22, 1987. The paper examines the Social Security consequences of smoking from the individual perspective. The authors reported that smoking costs men approximately $20,000 and women about $10,000 in expected net Social Security benefits. They also reported the loss in net Social Security benefits accompanying smoking to be very large relative to the other costs of smoking. The authors concluded that the lost income from Social Security exceeded the lifetime costs of cigarettes, and was significant in relation to medical costs and lost wages.

"Smoking and Health Implications of a Change in the Federal Cigarette Excise Tax," Kenneth E. Warner, Ph.D., *Journal of the American Medical Association*, February 28, 1986, Vol. 255. "Intentionally or inadvertently, a change in the Federal cigarette excise tax is a potent tool of health policy. The overall relative consumption impact of plausible tax changes is modest, only on the order of a few percentage points, but the size of the cigarette-smoking population means that even modest relative changes become substantial effects in terms of absolute magnitude."

Appendix C. State Cigarette Excise Taxes, Tax Revenue, and Tax Revenue as a Percentage of Health Care Costs

In the United States, excise taxes per carton of cigarettes ranged from $0.25 in Virginia to $8.15 in Washington state in 1995. Annual tax revenues from cigarettes for 1995, are shown in relation to adjusted 1993 direct medical care costs (physician, hospital, prescription drugs, etc.) related to smoking illnesses.

Comparison of Excise Taxes and Revenues to Health Care Costs

State	Excise Tax (per carton)	Net Tax Revenue (millions)	Smoking Related Health Care Costs (millions)	Tax Revenue as a Percent of Health Care Cost
Washington	$ 8.15	$ 195	$ 706	28
Michigan	7.50	275	1,352	20
District of Columbia	6.50	21	215	10
Rhode Island	6.10	40	186	22
Hawaii	6.00	30	129	23
Arizona	5.80	52	559	9
New York	5.60	721	3,132	23
Massachusetts	5.10	236	1,330	18
Connecticut	5.00	118	621	19
Minnesota	4.80	173	722	24
Vermont	4.40	13	80	16
Illinois	4.40	406	1,614	25
Wisconsin	4.40	158	683	23
North Dakota	4.40	22	87	25
Texas	4.10	534	2,007	27
New Jersey	4.00	252	1,136	22
Oregon	3.80	95	407	23
Maine	3.70	43	197	22
California	3.70	648	3,966	16
Iowa	3.60	92	319	29
Maryland	3.60	140	794	18
Nevada	3.50	46	198	23
Nebraska	3.40	45	174	26
Florida	3.39	422	2,302	18
South Dakota	3.30	15	82	18
Arkansas	3.15	78	296	26
Pennsylvania	3.10	347	1,982	18
Alaska	2.90	15	76	20
Idaho	2.80	16	84	19
Utah	2.65	25	114	22

Appendix C. State Cigarette Excise Taxes, Tax Revenue, and Tax Revenue as a Percentage of Health Care Costs

State	Excise Tax (per carton)	Net Tax Revenue (millions)	Smoking Related Health Care Costs (millions)	Tax Revenue as a Percent of Health Care Cost
New Hampshire	2.50	43	172	25
Ohio	2.40	274	1,643	17
Delaware	2.40	20	112	18
Kansas	2.40	53	297	18
Oklahoma	2.30	63	390	16
New Mexico	2.10	22	170	13
Louisiana	2.00	83	611	14
Colorado	2.00	58	504	12
Montana	1.80	12	102	12
Mississippi	1.80	46	264	17
Missouri	1.70	95	816	12
West Virginia	1.70	30	260	12
Alabama	1.65	66	573	12
Indiana	1.55	107	700	15
Tennessee	1.30	77	782	10
Georgia	1.20	83	880	9
Wyoming	1.20	6	51	12
South Carolina	.70	27	390	7
North Carolina	.50	36	833	4
Kentucky	.30	18	517	3
Virginia	.25	15	829	2

Note: The State cigarette tax, tax revenue, and health care costs were derived from the *State Tobacco Control Highlights - 1996*, Atlanta Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1996. *State Tobacco Control Highlights* is Centers for Disease Control and Prevention Publication No. 099-4895.

Appendix D. Comparison of Average Cigarette Prices

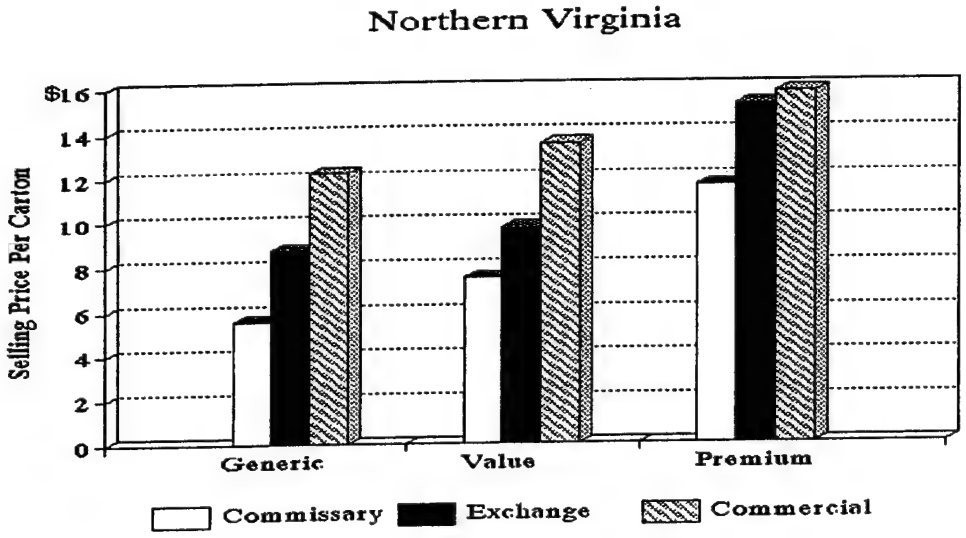


Figure D-1. Northern Virginia Commissary, DoD Exchange, and Commercial Market Cigarette Prices

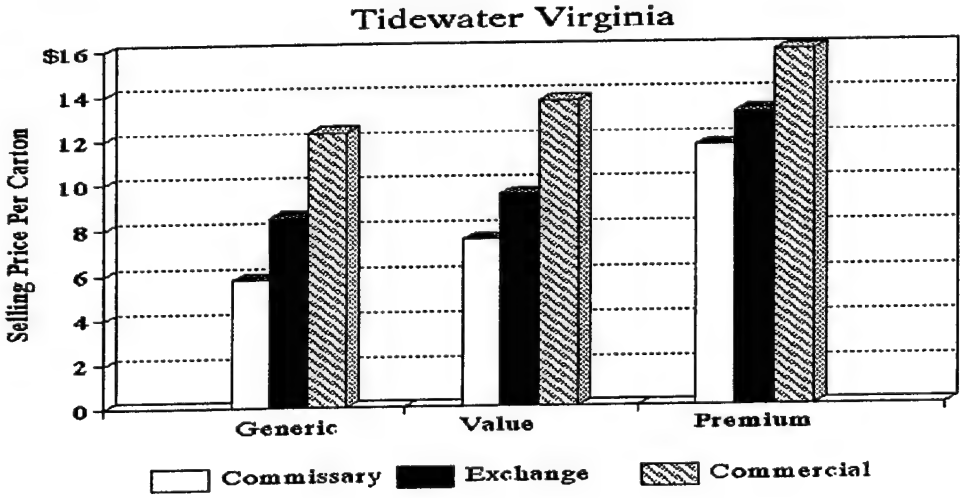


Figure D-2. Tidewater, Virginia, Commissary; DoD Exchange; and Commercial Market Cigarette Prices

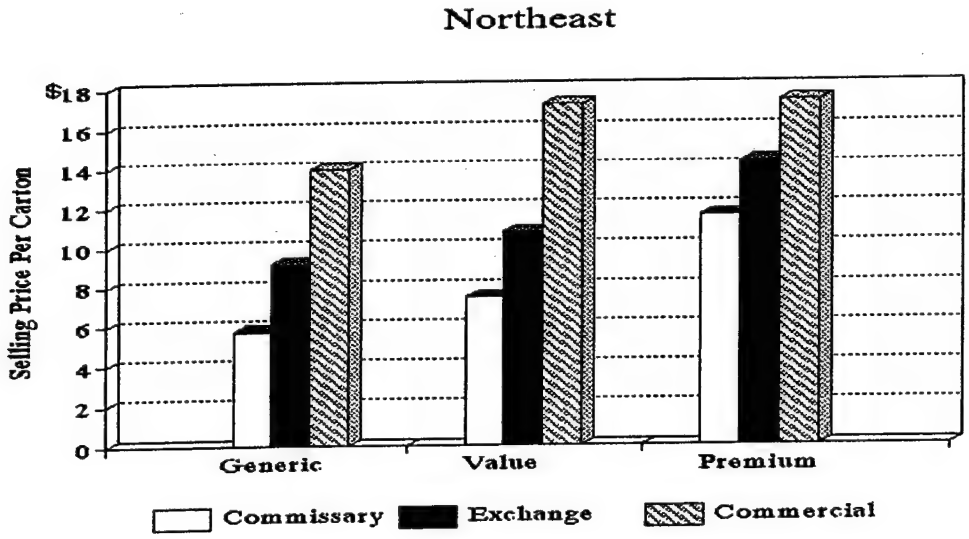


Figure D-3. Northeast Region Commissary, DoD Exchange, and Commercial Market Cigarette Prices

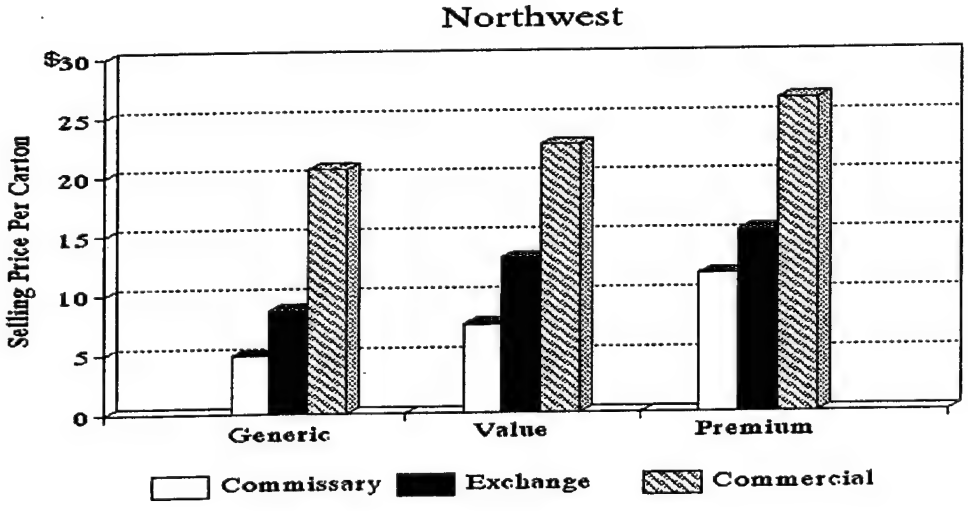


Figure D-4. Northwest Region Commissary, DoD Exchange, and Commercial Market Cigarette Prices

Appendix E. Commissaries With High Tobacco Sales

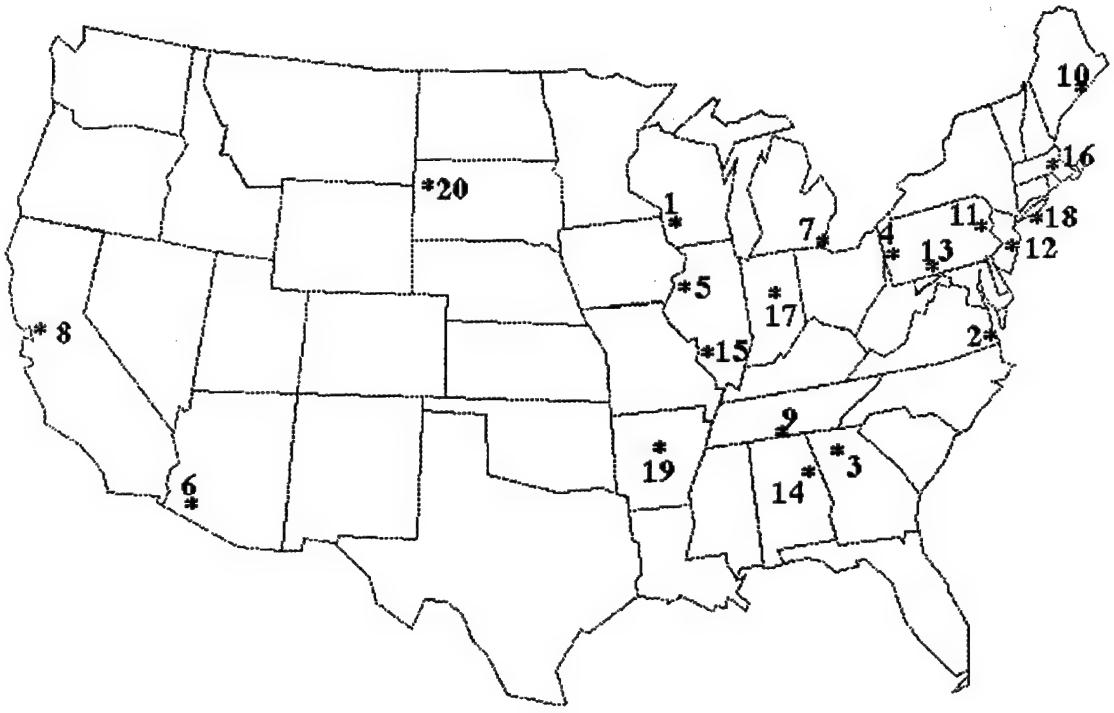


Figure E. Continental United States Commissaries With Tobacco Sales Greater Than 20 Percent

Key No.	Commissary	FY 1995 Retail Sales*	Tobacco Sales (percent)
1.	Fort McCoy, WI	$ 4,289,000	49
2.	Fort Monroe, VA	7,570,000	38
3.	Camp Merrill, GA	459,000	34
4.	Charles E. Kelly Support Facility, PA	8,839,000	31
5.	Rock Island Arsenal, IL	5,270,000	30
6.	Yuma Proving Grounds, AZ	2,223,000	30
7.	Selfridge Air National Guard Base, MI	24,986,000	29
8.	Oakland Air Base, CA	6,550,000	27
9.	Arnold Air Force Station, TN	$ 4,789,000	27
10.	Bangor Air National Guard Base, ME	6,358,000	27
11.	Tobyhanna Army Depot, PA	6,673,000	27
12.	Picatinny Arsenal, NJ	4,010,000	27

Key No.	Commissary	FY 1995 Retail Sales*	Tobacco Sales (percent)
13.	Defense Depot, New Cumberland, PA	5,209,000	25
14.	Fort McClellan, AL	20,699,000	24
15.	C.M. Price Support Center, IL	14,001,000	23
16.	Fort Devens, MA	14,451,000	22
17.	Fort Ben Harrison, IN	19,044,000	21
18.	Fort Hamilton, NY	11,039,000	21
19.	Little Rock Air Force Base, AR	36,291,000	20
20.	Belle Fourche Air Force Station, SD	508,000	20

Table E. European Commissaries With Tobacco Sales Greater Than 20 Percent

Commissary	FY 1995 Retail Sales*	Tobacco Sales (percent)
McCully Barracks, Germany	$ 314,000	36
Kirchgoens, Germany	1,706,000	28
Neubruecke, Germany	415,000	27
Royal Air Force Base Mildenhall, United Kingdom	1,669,000	21

*Annual retail sales include grocery, meat, and produce sales. Cigarette sales are included in grocery sales.

Appendix F. United States Deaths Related to Smoking and Years of Potential Life Lost

The 1996 State Tobacco Control Highlights, published by the National Center for Chronic Disease Prevention and Health Promotion, contains mortality rates due to smoking for persons aged 35 years and older. The rates were adjusted to the 1990 United States population to provide comparable estimates across states. The total number of years of life lost in the states due to smoking-related deaths are calculated to life expectancy at the time of death.

Years of Potential Life Lost for Deaths Attributable to Smoking

State	Overall Deaths Related to Smoking	Years of Potential Life Lost	Average Years of Potential Life Lost for Each Smoking Related Death
Alabama	6,801	90,360	13.3
Alaska	402	6,720	16.7
Arizona	5,697	66,959	11.8
Arkansas	4,706	58,742	12.5
California	42,574	498,297	11.7
Colorado	4,171	49,000	11.8
Connecticut	5,362	60,535	11.3
Delaware	1,178	15,248	12.9
District of Columbia	1,287	21,172	16.5
Florida	28,596	328,191	11.5
Georgia	9,694	134,168	13.8
Hawaii	1,174	15,222	13.0
Idaho	1,304	14,708	11.3
Illinois	19,269	235,933	12.2
Indiana	10,250	123,584	12.1
Iowa	4,816	50,521	10.5
Kansas	3,828	42,540	11.1
Kentucky	7,449	94,602	12.7
Louisiana	6,887	94,886	13.8
Maine	2,376	27,419	11.5
Maryland	7,370	92,197	12.5
Massachusetts	10,430	117,640	11.3
Michigan	15,454	195,600	12.7
Minnesota	6,127	67,835	11.1
Mississippi	4,458	57,839	13.0
Missouri	10,177	122,136	12.0
Montana	1,313	14,491	11.0
Nebraska	2,675	29,075	10.9
Nevada	2,234	30,254	13.5
New Mexico	1,741	21,156	12.2
New Hampshire	1,655	18,993	11.5
New Jersey	12,605	151,773	12.0
New York	30,992	377,530	12.2
North Carolina	11,032	147,810	13.4
North Dakota	1,031	11,717	11.4
Oregon	5,226	59,217	11.3

Appendix F. United States Deaths Related to Smoking and Years of Potential Life Lost

State	Overall Deaths Related to Smoking	Years of Potential Life Lost	Average Years of Potential Life Lost for Each Smoking Related Death
Ohio	18,114	231,497	12.8
Oklahoma	6,138	73,057	11.9
Pennsylvania	22,624	271,839	12.0
Rhode Island	1,881	21,541	11.5
South Carolina	5,619	79,069	14.1
South Dakota	1,175	12,684	10.8
Tennessee	10,214	132,635	13.0
Texas	25,452	317,631	12.5
Utah	1,228	14,572	11.9
Vermont	913	10,631	11.6
Virginia	9,237	119,716	13.0
Washington	7,790	89,222	11.5
West Virginia	4,221	51,007	12.1
Wisconsin	7,620	86,345	11.3
Wyoming	659	7,298	11.1
Total	**418,690**	**5,048,740**	12.1

Appendix G. Risks Attributable to Smoking

Risks attributable to smoking are measures of the maximum proportion of cases of a disease causally linked to cigarette smoking. A risk attributable to smoking is defined as the ratio of mortality among current or former smokers to the mortality of those who never smoked. Risk measures attributable to smoking are a function of two other measures, current and former smoking prevalence rates and relative risks.

Risks attributable to smoking were developed from studies by the U.S. Department of Health and Human Services and other independent researchers. The SAMMEC model software uses updated relative risk estimates derived from the most recent American Cancer Society data. The relative risk estimates are classified by International Classification of Diseases, 9th Revision (ICD-9) code. The codes, related diagnoses, and the ratio of the mortality rate for current or former smokers compared with those who never smoked are shown below.

Mortality Ratios Attributable to Smoking

ICD-9 Code	Diagnoses	Male		Female	
		Current Smoker	Former Smoker	Current Smoker	Former Smoker
Cancers					
140-149	Lip, oral cavity, pharynx	27.48	8.80	5.59	2.88
150	Esophagus	7.60	5.83	10.25	3.16
157	Pancreas	2.14	1.12	2.33	1.78
161	Larynx	10.48	5.24	17.78	11.88
162	Trachea, lung, bronchus	22.36	9.36	11.94	4.69
180	Cervix uteri	N/A	N/A	2.14	1.94
188	Urinary bladder	2.86	1.90	2.58	1.85
189	Kidney, other urinary	2.95	1.95	1.41	1.16
Cardiovascular Diseases					
390-398	Rheumatic heart disease	1.85	1.32	1.69	1.16
401-404	Hypertension	1.85	1.32	1.69	1.16
410-414	Ischemic heart disease				
	Ages 35 to 64	2.81	1.75	3.00	1.43
	Ages 65 and up	1.62	1.29	1.60	1.29
415-417	Pulmonary heart disease	1.85	1.32	1.69	1.16
420-429	Cardiac arrest/other heart disease	1.85	1.32	1.69	1.16
430-438	Cerebrovascular disease				
	Ages 35 to 64	3.67	1.38	4.80	1.41
	Ages 65 and up	1.94	1.27	1.47	1.01
440	Atherosclerosis	4.06	2.33	3.00	1.34
441	Aortic aneurysm	4.06	2.33	3.00	1.34

Appendix G. Risks Attributable to Smoking

ICD-9 Code	Diagnoses	Male Current Smoker	Male Former Smoker	Female Current Smoker	Female Former Smoker
Respiratory Diseases					
010-012	Respiratory tuberculosis	1.99	1.56	2.18	1.38
480-487	Pneumonia, influenza	1.99	1.56	2.18	1.38
491-492	Bronchitis, emphysema	9.65	8.75	10.47	7.04
493	Asthma	1.99	1.56	2.18	1.38
496	Chronic airways obstruction	9.65	8.75	10.47	7.04
Perinatal Conditions*					
765	Short gestation/low birth weight	1.76		1.76	
769	Respiratory distress syndrome	1.76		1.76	
770	Respiratory conditions-newborn	1.76		1.76	
798	Sudden infant death syndrome	1.76		1.76	

*Deaths among infants less than 1 year old.

Appendix H. Report Distribution

Office of the Secretary of Defense

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  Deputy Chief Financial Officer
  Deputy Comptroller (Program/Budget)
Under Secretary of Defense (Personnel and Readiness)
Assistant Secretary of Defense (Force Management Policy)
  Executive Director of Morale, Welfare, and Recreation and Resale Activities
Assistant Secretary of Defense (Health Affairs)
Assistant Secretary of Defense (Reserve Affairs)
Assistant to the Secretary of Defense (Public Affairs)
Director, Defense Logistics Studies Information Exchange

Department of the Army

Auditor General, Department of the Army

Department of the Navy

Assistant Secretary of the Navy (Financial Management and Comptroller)
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Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Subcommittee on Labor, Health and Human Services, and Education, Committee on Appropriations
Senate Committee on Armed Services
Senate Subcommittee on Personnel, Committee on Armed Services
Senate Committee on Governmental Affairs
Senate Committee on Finance
Senate Subcommittee on Medicare, Long-Term Care and Health Insurance, Committee on Finance
Senate Committee on Labor and Human Resources
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House Subcommittee on Labor, Health and Human Services, and Education, Committee on Appropriations
House Subcommittee on National Security, Committee on Appropriations
House Committee on Commerce
House Subcommittee on Health, Committee on Commerce
House Committee on Government Reform and Oversight
House Subcommittee on National Security, International Affairs, and Criminal Justice, Committee on Government Reform and Oversight
House Committee on National Security
House Subcommittee on Military Personnel, Committee on National Security
Morale, Welfare and Recreation Panel, Committee on National Security
House Committee on Veterans Affairs
House Subcommittee on Hospitals and Health Care, Committee on Veterans Affairs
House Committee on Ways and Means
House Subcommittee on Health, Committee on Ways and Means

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Part III - Management Comments

Assistant Secretary of Defense (Force Management Policy) Comments

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

FORCE MANAGEMENT POLICY

DEC 6 1996

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING

SUBJECT: Draft Evaluation Report on the Economic Impact of the Use of Tobacco in DoD (Project No. 6LF-0050)

The subject draft report demonstrates a thorough and timely analysis of a difficult and contentious issue. This report and the research behind it has become invaluable in the Department of Defense's drive to meet the *Healthy People 2000* goals. In support of this endeavor and in response to your request, the following comments are provided:

- **Recommendation 1.** Establish policy requiring prices for tobacco products sold in DoD retail outlets to be equivalent to prices at local commercial retail outlets.

  DoD Response. Partially concur. The Department agrees with raising tobacco prices in commissaries and has already taken a measured approach. On November 1, 1996, commissaries became the outlet for the sale of exchange tobacco products and the prices increased to the prevailing military exchange price. This action by DoD represents a major increase in prices and removes a conflicting policy which subsidized a product that results in additional costs to the taxpayer through DoD health costs, lost productivity and decreased readiness. We believe this complies with the spirit of the draft report's recommendation.

  Prices should continue to be set by the exchanges based upon the new policy and market forces, not on an attempt to identify and match a targeted high or low commercial price as stated in the recommendation. All retail items are gauged to reflect the prevailing civilian market price but do not necessarily consistently attain parity. Overseas, implementation of the recommended policy would place service members at a serious disadvantage since the local commercial tobacco costs are typically much higher than in the United States. In addition, direct comparison would be very difficult or impossible since similar tobacco categories and brands may not even exist in the local overseas markets. A change in current policy can be considered once the effect of the recent price increase is analyzed and understood.

  Recommendation 1 should be changed to: "Establish policy requiring prices for tobacco products sold in all DoD military retail outlets to be at the prevailing military exchange price."

- **Recommendation 2.** Request congressional approval to set tobacco prices in commissaries at levels equivalent to commercial markets.

Final Report Reference

DoD Response. Nonconcur. This recommendation should be withdrawn since it has been superseded by the Department's action to no longer sell tobacco products as a commissary item. Rather, the commissaries are now simply outlets for exchange tobacco products.

Revised Recommendation 2.

Recommendation 2 should be deleted.

- **Recommendation 3.** Direct the DoD retail system to eliminate the use of vendor installed coupons on tobacco products available for resale in the DoD retail system.

DoD Response. Partially concur. Promotional practices in the military retail system should reflect commercial practices.

Revised Recommendation 3.

Recommendation 3 should be changed to: "Ensure the DoD retail system adopts promotional practices which reflect commercial practices."

Stephen O Rossetti, Jr.
Executive Director, MWR & Resale Activities

Assistant Secretary of Defense (Health Affairs) Comments

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, DC 20301-1200

HEALTH AFFAIRS

22 NOV 1996

MEMORANDUM FOR DIRECTOR, LOGISTICS SUPPORT DIRECTORATE, OFFICE OF THE INSPECTOR GENERAL

SUBJECT: Evaluation Report on the Economic Impact of the Use of Tobacco in DoD (Project No. 6LF-0050)

We concur with the findings and recommendations in this report. Health Affairs has supported pricing tobacco product sales at rates comparable to the civilian sector since the early eighties. With DoD retail pricing systems policy at equivalent commercial pricing, we send a clearer message for the promotion of a healthy active duty force.

We look forward to working closely with you in the continued implementation of this and other policies that affect health promotion.

John F. Mazzuchi

John F. Mazzuchi, Ph.D.
Deputy Assistant Secretary
(Clinical Services)

Evaluation Team Members

This report was prepared by the Logistics Support Directorate, Office of the Assistant Inspector General for Auditing, DoD.

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